

ABSTRACT OF THE DISCLOSURE

The present invention provides a manufacturing method and manufacturing device for high-precision thin film devices, whereby the film thickness and film thickness distribution of a transparent film is measured to a high degree of accuracy during processing, and the film thickness can be controlled with high precision during CMP processing, by accurately measuring the film thickness of the uppermost layer, without being affected by the film thickness distribution between LSI regions or within the semiconductor wafer surface generated by CMP processing.

The field of view and measurement position used for measuring the film thickness of a transparent film during processing are set such that the measured area is not affected by the film thickness distribution of the actual device patterns subjected to CMP processing. Moreover, the film thickness is measured by specifying relatively level measurement regions, according to a characteristic quantity of the spectral waveform of the reflected light from the transparent film, such as the reflection intensity, frequency spectrum intensity, or the like, thereby permitting highly accurate control of film thickness. Consequently, the levelling process in CMP processing can be optimized on the basis of the film thickness distribution, the film deposition conditions in the film deposition stage and the etching

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conditions in the etching stage can also be optimized, and hence a high-precision semiconductor device can be manufactured.